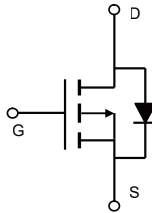


Description

Features ● $V_{DS} = -30V$, $I_D = -100A$ $R_{DS(ON)} < 5.3m\Omega$ @ $V_{GS} = -10V$ $R_{DS(ON)} < 8.2m\Omega$ @ $V_{GS} = -4.5V$ ● Advanced Trench Technology ● Excellent $R_{DS(ON)}$ and Low Gate Charge ● Lead free product is acquired	Application ● PWM Applications ● Load Switch ● Power Management <i>100% UIS TESTED!</i> <i>100% ΔV_{ds} TESTED!</i>
 TO-252	 Schematic

Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	Reel Size	Reel (PCS)	Per Carton (PCS)
VSM100P03	VSM100P03-T2	TAPING	TO-252	13inch	2500	25000

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Symbol	Parameter		Max.	Units
V _{DSS}	Drain-Source Voltage		-30	V
V _{GSS}	Gate-Source Voltage		±20	V
I _D	Continuous Drain Current	T _C = 25°C	-100	A
		T _C = 100°C	-65	A
I _{DM}	Pulsed Drain Current ^{note1}		-400	A
E _{AS}	Single Pulsed Avalanche Energy ^{note2}		225	mJ
P _D	Power Dissipation	T _C = 25°C	103	W
R _{θJC}	Thermal Resistance, Junction to Case		1.46	°C/W
T _J , T _{STG}	Operating and Storage Temperature Range		-55 to +175	°C

Electrical Characteristics (T_J=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D = -250μA	-30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -30V, V _{GS} =0V,	-	-	-1	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D = -250μA	-1.0	-1.5	-2.5	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	V _{GS} = -10V, I _D = -30A	-	4	5.3	mΩ
		V _{GS} = -4.5V, I _D = -20A	-	5.8	8.2	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = -15V, V _{GS} =0V, f=1.0MHz	-	9400	-	pF
C _{OSS}	Output Capacitance		-	1000	-	pF
C _{rSS}	Reverse Transfer Capacitance		-	767	-	pF
Q _g	Total Gate Charge	V _{DS} = -15V, I _D = -30A, V _{GS} = -10V	-	42	-	nC
Q _{gs}	Gate-Source Charge		-	8.4	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	11.2	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} = -15V, I _D = -30A, V _{GS} = -10V, R _{GEN} =2.5Ω	-	15	-	ns
t _r	Turn-on Rise Time		-	16	-	ns
t _{d(off)}	Turn-off Delay Time		-	69	-	ns
t _f	Turn-off Fall Time		-	27	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-100	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-400	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S = -30A	-	-0.8	-1.2	V

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. E_{AS} condition: T_J=25°C, V_{DD}= -15V, V_G= -10V, R_G=25Ω, L=0.5mH, I_{AS}= -30A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

Typical Performance Characteristics

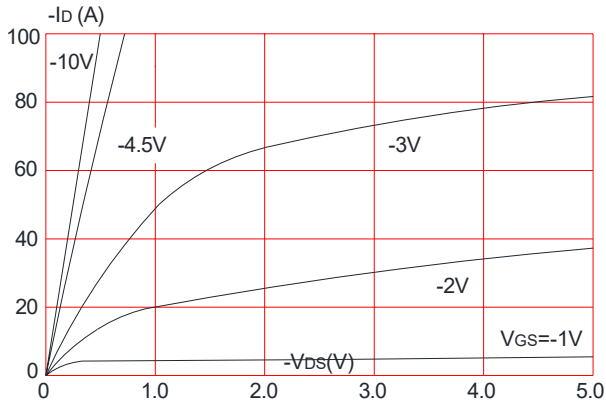
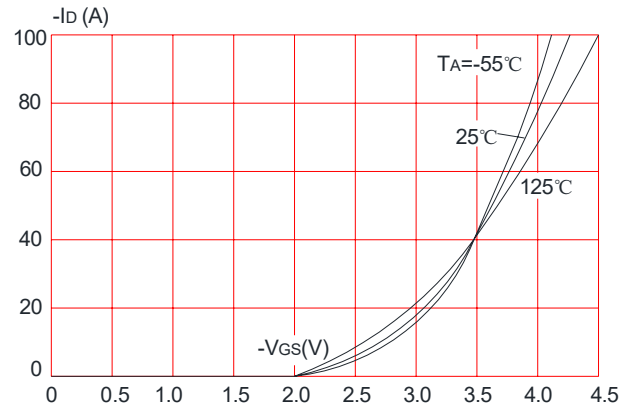
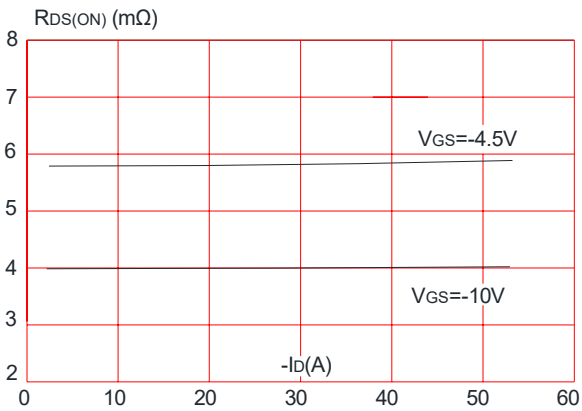
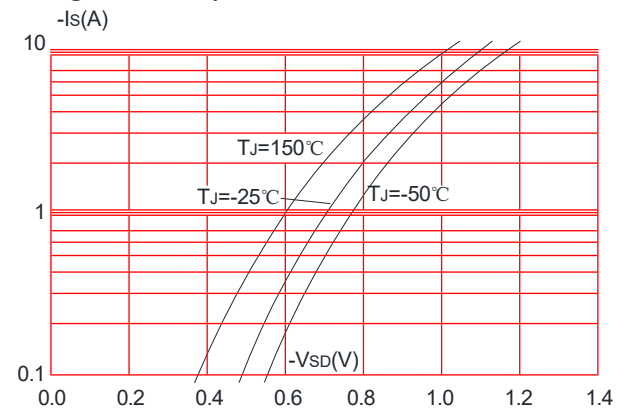
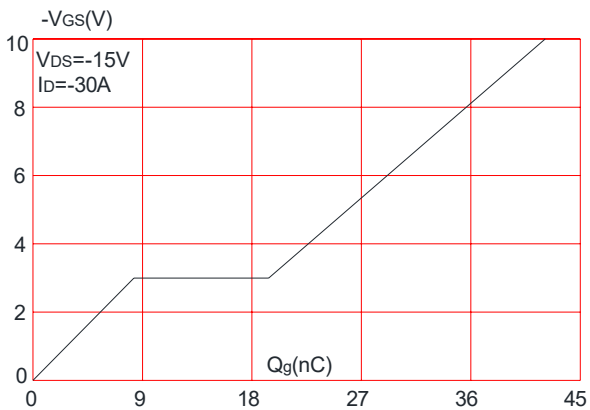
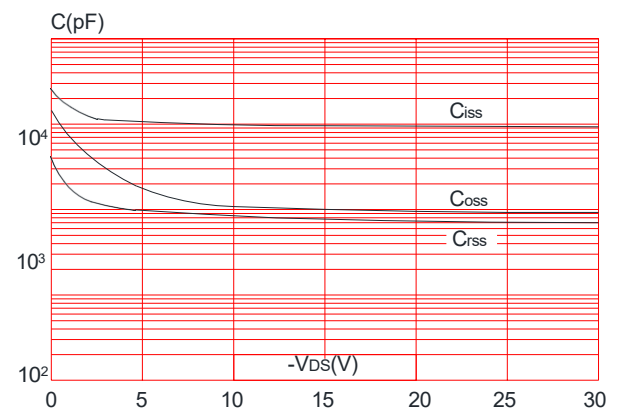
Figure1: Output Characteristics

Figure 2: Typical Transfer Characteristics

Figure 3: On-resistance vs. Drain Current

Figure 4: Body Diode Characteristics

Figure 5: Gate Charge Characteristics

Figure 6: Capacitance Characteristics


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

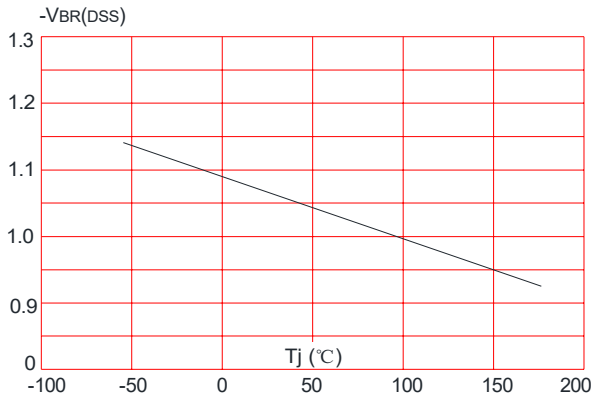


Figure 8: Normalized on Resistance vs. Junction Temperature

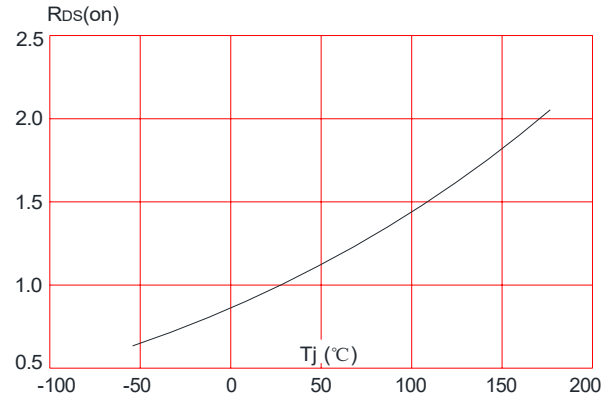


Figure 9: Maximum Safe Operating Area

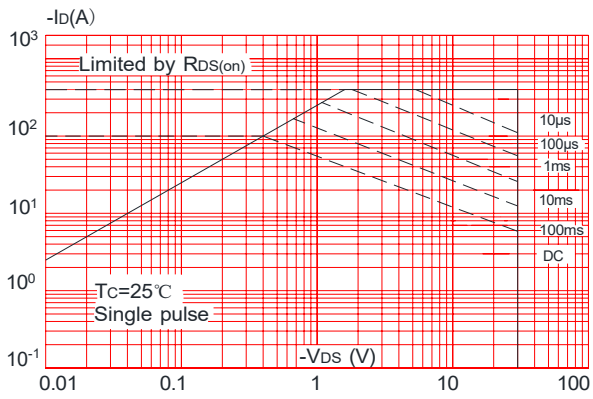


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

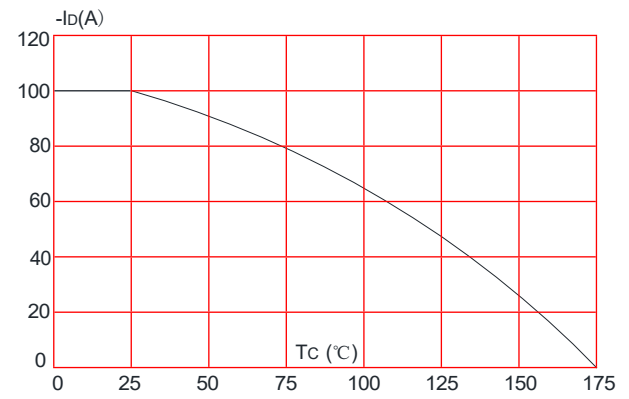
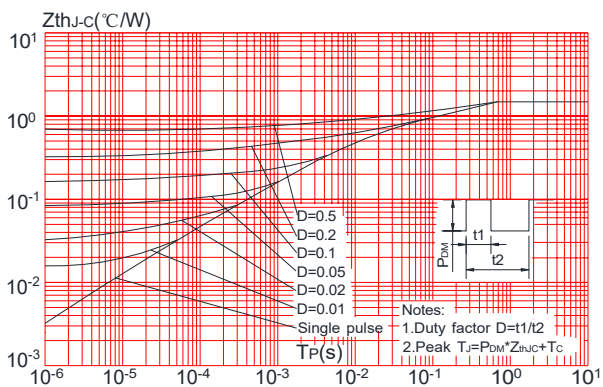
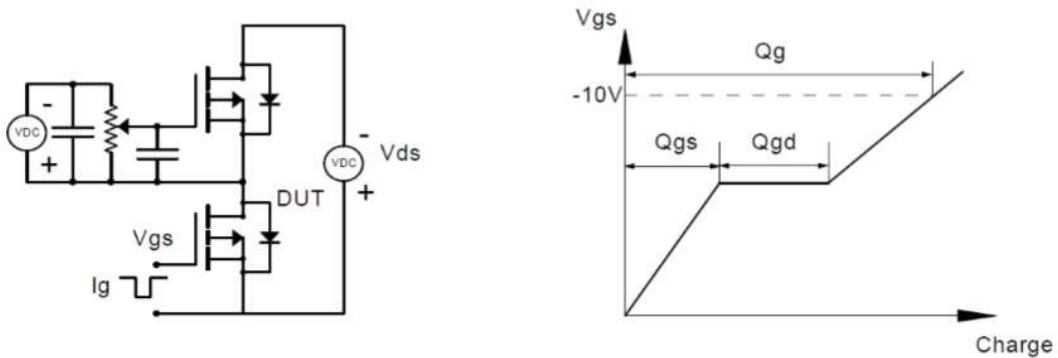


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

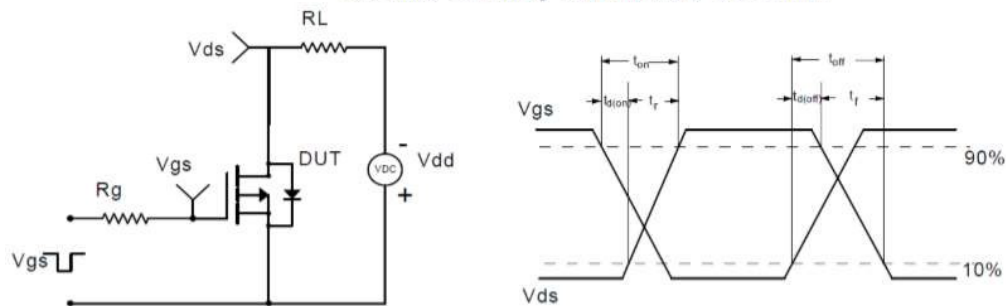


Test Circuit

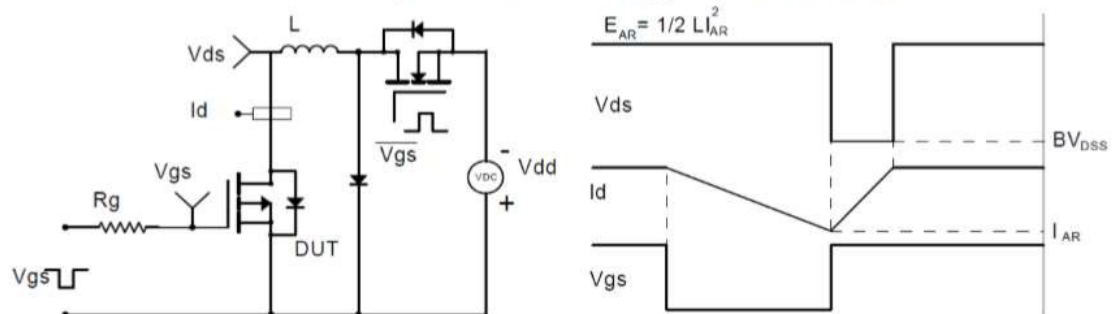
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

